COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

JANE M. SWIFT
Governor

BOB DURAND
Secretary

LAUREN A. LISS
Commissioner

February 5, 2001

Site Screening for Siting a New or Expanding Source of Public Water Supply

The Department of Environmental Protection (DEP) is committed to early identification of issues relevant during the New Source Approval process for public water supplies. The Site Exam phase will now require that project proponents complete alternatives analysis, a water conservation questionnaire, the attached site screening document and publish public notice in The Environmental Monitor. Conducting alternatives analysis and assessing water conservation measures earlier in the process, and the use of a preliminary screening tool and public notice will ensure that the project proponent and interested parties will have an opportunity to identify issues and state concerns about proposed source locations. Early identification of issues can help to minimize environmental impact and minimize cost and delay to the project proponent. Identification of these issues will assist the agencies and the proponent in determining whether the proposed source is economically viable and protective of the environment and other water users, and will increase technical and regulatory information needed for pumping test design. The public notice will be published in The Environmental Monitor for proposed public water supply sources subject to the Water Management Act. The Department of Environmental Protection will accept written comments regarding proposed sites for a short time following publication of the notice.

A variety of environmental laws may apply to new source development depending on the location and the project design. Applicable laws may include the Safe Drinking Water Act, the Water Management Act, the Wetlands Protection Act, the Interbasin Transfer Act, the Endangered Species Act, and the Clean Water Act. The Department's Guidelines and Policies for Public Water Systems provide additional guidance about the necessary approvals and the timing of obtaining them.

"Site Screening for Siting New or Expanding Source of Water Supply" will allow proponents to screen each site under consideration, enabling them to make informed decisions in selecting sites and evaluating alternatives for new source development. Project proponents of new sources that will exceed the withdrawal threshold of the Water Management Act noted herein, should apply the screening criteria to each source under consideration.
This guidance should not be considered to be a final determination of the approvability of sites, but is intended to provide direction regarding significant issues that will have to be addressed if a particular site is pursued.

It is the goal of DEP to ensure a reliable supply of safe drinking water at an affordable cost in a manner which has the least possible environmental impact. The Department promotes efficient operation and maintenance of water supply and distribution systems, and the use of storm water management and wastewater disposal systems that recharge groundwater. DEP promotes and implements policies which require the assessment of future demands, the improvement of the efficiency of water supply systems, and conservation to avoid the capital costs and environmental impacts associated with the development of new supplies.

_____
Glenn Haas, Acting Assistant Commissioner

This information is available in alternate format. Call Aprel McCabe, ADA Coordinator at 1-617-556-1171. TDD Service - 1-800-298-2207.

DEP on the World Wide Web: http://www.mass.gov/dep
Printed on Recycled Paper

This information is available in alternate format by calling our ADA Coordinator at (617) 574-6872.

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REQUEST FOR SITE EXAM
Water Management Program

February 5, 2001

Site Screening Worksheet for Siting a New or Expanding Source of Public Water Supply

For a Public Water Supply Pumping 100,000 GPD or Greater

Submit two copies of this form for each source with the Request For Site Exam documentation to DEP/ Drinking Water Program.

Applicant: _____
Consultant: _____ Phone: _____
Site Name _____ Basin : _____

Section A: Demand Management

1. What is the maximum withdrawal rate you are seeking for your proposed source in million gallons per day (mgd)? __ . __ __ mgd.

	Existing	Final 5-yr block Permit Volume	Buildout*
2. What is the average day demand (mgd) of your system?	_____	_____	_____
3. What is the peak day demand (mgd) of your system?	_____		
4.a. What is the approved pumping rate (mgd) of your system?	_____		

b. Do any of these sources have restricted capacity? If so, briefly indicate which sources and the reasons for the capacity restrictions in the space below.

5. Can you meet your average day demand with your largest source off-line? Yes ☐ No ☐

*Buildout: EOEA Community Preservation Initiative Buildout projections (See Appendix B). If these projections are not available for your town, note the source of your Buildout projections below.

Section A: Demand Management (cont.)

Note: Failure to meet water conservation standards may jeopardize your application. Prior to commencement of the development of a new public source, the proponent should conduct a thorough analysis of system demand and have a viable water conservation program in place. Complete the Water Conservation Plan and refer to DEP/Water Management conservation guidelines, *Guidelines and Policies for Public Water Systems, Section 10, revised August, 1996, or as amended; and Water Conservation Standards for the Commonwealth of Massachusetts, adopted 1992.*

If your proposed withdrawal involves an interbasin transfer, also refer to DEM/Office of Water Resources Interbasin Transfer Act water conservation measures in, *Appendix A, Interbasin Transfer Act Performance Standards Guidance, approved 8/12/99, and A Guideline to the Application of the Interbasin Transfer Act and Regulations, December 1985.*

Section B. Potential Environmental Impact

Presence of sensitive or multiple receptors may limit site availability for water supply withdrawal.

1. Which of the following sensitive receptors exist within 1000' of your site?
   (Consult the most recent Massachusetts Natural Heritage Program Atlas, MassGIS and other sources.)

   - Areas of Critical Environmental Concern Yes _____ No _____
   - Priority habitat for rare and endangered species Yes _____ No _____
   - Lakes and ponds (or other surface water features) Yes _____ No _____
   - Vernal pools Yes _____ No _____
   - Stocked trout streams Yes _____ No _____

     (See Massachusetts Stocked Trout Waters listing on website: www.state.ma.us/dfwele*)*

   Additional considerations:
   - Cold water fisheries resource
   - NPDES permit sites (National Pollution Discharge Elimination System)

2. Which of the following potential threats or sensitive receptors exist within one-half mile of your site?
   (Consult the DEP website at www.state.ma.us/dep*, MassGIS and other sources)*

   - Hazardous waste sites Yes _____ No _____
   - Wastewater treatment facilities Yes _____ No _____
   - CSOs or SSOs Yes _____ No _____
   - Landfills Yes _____ No _____
   - Agricultural uses Yes _____ No _____
   - Automobile graveyards and junkyards Yes _____ No _____
   - Industrial Park/plant Yes _____ No _____
   - Petroleum and oil bulk stations and terminals Yes _____ No _____
   - Public water withdrawals Yes _____ No _____
   - Private wells Yes _____ No _____

Section B-1. Stream and Basin Section

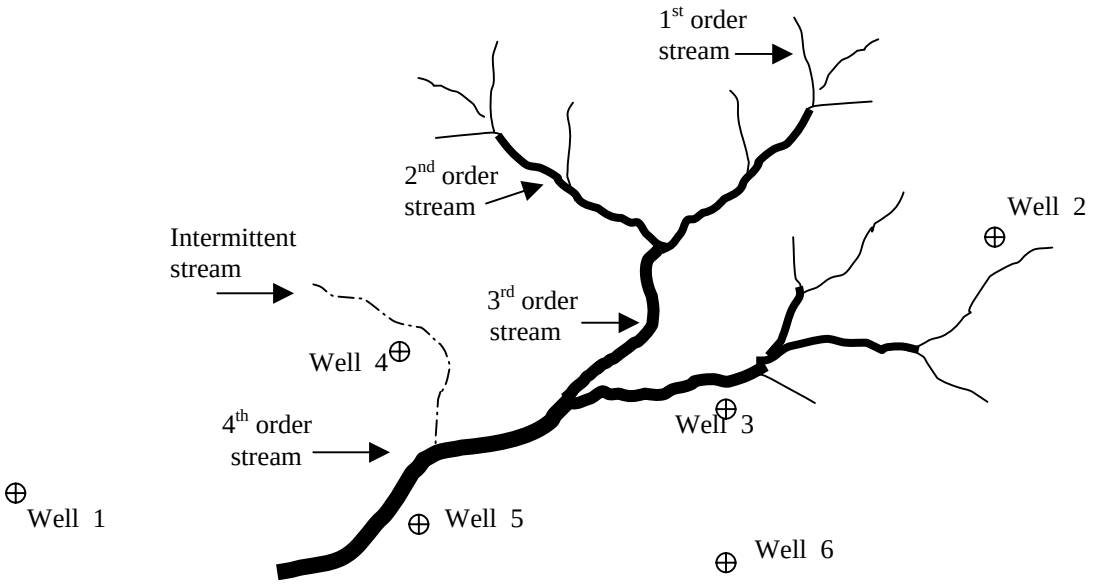
This section is intended to preliminarily evaluate the impacts of proposed sources on streamflow and availability of water in the river basin. The graphic below depicting stream order and well placement illustrates how well location may impact streamflow.

The purpose of this section is not to approve or deny siting a new source, but rather to provide an advisory for caution where siting a withdrawal that may have a significant impact on streamflow.

Stream Order:
A stream of first order is one that has no tributaries. When two streams of first order join, a stream segment of second order begins that may have one or several first-order tributaries along its length. When two streams of second order join, a single stream of third order begins. This stream extends until joined by another third-order river, and there, the fourth order begins, and so on. A junction with a lower-order channel does not change the order of the higher-order stream. (Adapted from the Handbook of Hydrology, 1993)

WATER WITHDRAWAL CONSIDERATION ON STREAMFLOW

PROXIMITY AND STREAM ORDER



Assuming the same pumping rate and a hydrological connection for induced infiltration between a well and a stream, proximity and stream order are two factors which may have a serious impact on flow. Generally, the nearer the withdrawal is to a stream, the greater the impact on flow; and the lower the level of stream order, the greater the impact of a withdrawal on flow. As illustrated above, Wells 1 and 6 may have minimal or no impact on streamflow. Well 5, located near a higher order stream may have less impact on flow than Well 3. Wells 2 and 4 may have the greatest impact on flow due to their close proximity to a first order stream and an intermittent stream.

The following stream screening criteria provides guidance concerning a withdrawal's potential for impact on flow. Generally, for a withdrawal pumping rate less than 7Q10 flow, no significant impact is anticipated. Withdrawals greater than 7Q10 flow, let alone larger pumping volumes greater than 50% of August Median flow, may have significant impacts on flow. Low flow stream statistics (7Q10 and August Median) may be obtained from U.S. Geological Survey (USGS) website noted below. However, statistics obtained from this website are based on unregulated streams and do not take into account cumulative effects on streamflow from existing withdrawals or other impacts, and the proposed withdrawal may warrant further site screening assessment. Stream threshold indicators may also be more restrictive in basins that DEP has determined to be hydrologically stressed.

Responses to the following questions will require internet access to obtain low flow stream statistics from the USGS steamflow statistics website, http://ma.water.usgs.gov/streamstats. The USGS website provides streamflow statistics and basin characteristics for locations of interest by use of an automated procedure that measures characteristics of the land surface area (basin) that drains to the stream and inserts those characteristics into equations that estimate the streamflow statistics (7Q10, August Median, etc).

> This methodology is designed to estimate the impact on flow from one proposed withdrawal on an unregulated stream. Withdrawals impacting more than one stream, or where multiple withdrawals or other impacts in the drainage area already exist, will require additional site-specific screening.

Basically, the application allows a user to mouse-click on a point in a stream, from which the program will delineate the contributing watershed drainage area on a map and generate low flow stream statistics along with basin characteristics. Instructions for use are on the website. The USGS display map and corresponding data printout for the proposed withdrawal must be enclosed with this application. Once the low flow statistics have been obtained, the data must be converted into cubic feet per second per square mile (cfsm) and compared to the withdrawal rate.

The click point for the application is the point where the stream intersects the downgradient extent of the preliminary Zone II. The preliminary Zone II delineation is a requirement in the Drinking Water Request For Site Exam part of this application. DEP assumes 100% hydrogeologic communication between the well and the stream so that every drop of water pumped comes from the stream. However, the Department will also consider applied site specific stream depletion methodologies (Jenkins, Barlow, etc.), that attempt to quantify stream flow depletion by wells under Zone II conditions. In such cases, the reduced flow impact may substitute for the withdrawal when comparing the withdrawal rate to stream indicators 7Q10 and 50% of August Median.

To determine the withdrawal's impact on streamflow, follow the steps below.

Step 1: Convert the proposed withdrawal rate given in million gallons per day (Page 1, Section A, Question 1) to gallons per day, and then to cubic feet per second using the following formula:

$$\frac{\text{\_\_\_\_\_ gallons per day}}{7.48 \text{ gal/cu.ft.} \times 1440 \text{ min/day} \times 60 \text{ seconds/minute}} = \text{\_\_\_\_\_ cfs}$$

Step 2: Determine the contributing drainage area in square miles for the proposed withdrawal location. This area must be determined with the USGS watershed tools by clicking on the stream intersect with the preliminary Zone II at the downgradient point.

What is the contributing drainage area of the proposed withdrawal? _____ square miles

What is the distance in feet from the proposed withdrawal to the nearest stream? _____ feet

Step 3: Conversion to cfsm:

Find the flow per unit area (cfsm) for the withdrawal at this location by dividing the cfs flow found in Step 1 by the contributing drainage area in Step 2:

$$\frac{\text{withdrawal (cfs)}}{\text{drainage area (sq. mi.)}} = \text{cfsm}$$

Example: Find cfsm for a proposed withdrawal at 0.5 mgd with an upgradient watershed of 5 square miles.

Note: 0.5 mgd converts to .77 cfs

$$\frac{\text{withdrawal (0.5 mgd) or } 0.77 \text{ cfs (Step 1)}}{\text{upgradient watershed } 5 \text{ sq. mi. (Step 2)}} = 0.154 \text{ cfsm (Step 3)}$$

Step 4: The 7Q10 streamflow, measured in cfs, represents the probable minimum flow over a 7-day period that will occur on average once in 10 years. With the USGS website, obtain the 7Q10 cfs flow for the stream location point, convert 7Q10 cfs to cfsm (Step 3), and compare this flow with your proposed withdrawal.

7Q10 flow _____ cfs
7Q10 flow _____ cfsm

Withdrawals which are greater than 7Q10 cfsm of a stream have the potential to increase the frequency and duration of low flow, and may result in moderate to significant environmental impact. Such withdrawals may be unapprovable or severely restricted by permit conditions. This guidance should be used as a planning tool, and applicants are encouraged to select alternatives that minimize environmental impact and meet other water supply planning objectives for water quality and productivity. Further analysis will be necessary to determine the potential impact of all proposed withdrawals and mitigating circumstances.

Step 5: With the USGS website, obtain the August Median cfs flow for the stream at the designated point, convert the August Median cfs to cfsm (Step 3), take 50% of August Median (cfsm) and compare this flow with your proposed withdrawal in cfsm.

August Median: _____ cfs
August Median: _____ cfsm
50% August Median: _____ cfsm

Impacts on streamflow are best determined through physical characteristics of the watershed, site hydrology and pumping tests, but as a screening guideline, a proposed source in which the withdrawal rate of a watershed area is **50% of the August Median** (cfsm) or greater, is considered to have the potential to significantly reduce streamflow. Such withdrawals may be unapprovable or severely restricted by permit conditions. This guidance should be used as a planning tool, and applicants are encouraged to select alternatives that minimize environmental impact and meet other water supply planning objectives for water quality and productivity. Further analysis will be necessary to determine the potential impact of all proposed withdrawals and mitigating circumstances.

Since the August Median statistic may reflect wide ranging and relatively high flows, particularly in small watershed drainage areas, the more conservative 50% of August Median flow was selected as the screening threshold level to protect impacts on river flow from withdrawals.

Section C. Regulatory Review

1. Name all potential water supplies which you have under consideration, including regional sources and those located in other communities, and attach a locus map depicting the location of each.

   _____

   _____

   _____

2. Massachusetts Environmental Policy Act (MEPA) *(MGL ch 30 s. 61 through 62H) (301 CMR 11.00)*

   MEPA provides meaningful opportunities for public review of the potential environmental impacts of projects for which agency action is required. The MEPA review is an informal administrative process of environmental planning that enables the proponent and each participating agency to consider the positive and negative, short-term and long-term, and cumulative potential environmental impacts for all phases of a project. *(See MEPA website at www.ma.state.us/MEPA.)*

   MEPA review thresholds for water: *(301 CMR 11.03(4)) (other non-water thresholds may also apply)*

   ENF and Other MEPA Review if the Secretary So Requires.

   - new withdrawal or expansion of withdrawal of 100,000 or more gpd from a new water source that requires new construction for the withdrawal.
   - new withdrawal or expansion of withdrawal of 500,000 or more gpd from a water supply system above the lesser of current system-wide authorized withdrawal volume or three-years' average system-wide actual withdrawal volume.
   - construction of one or more new water mains five or more miles in length.
   - construction of a new drinking water treatment plant with a capacity of 1,000,000 or more gpd.
   - expansion of an existing drinking water treatment plant by the greater of 1,000,000 gpd or 10% of existing capacity.
   - alteration requiring a variance in accordance with the Watershed Protection Act, unless the project consists solely of one single family dwelling.
   - non-bridged steam crossing 1,000 or less feet upstream of a public surface drinking water supply for purpose of forest harvesting activities.

   ENF and Mandatory EIR*:*

   - new withdrawal or expansion in withdrawal of
     - 2,500,000 or more gpd from a surface water source; or
     - 1,500,000 or more gpd from a groundwater source.
   - new interbasin transfer of water of 1,000,000 or more gpd from a surface or groundwater source or any amount determined significant by the Water Resource Commission.
   - construction of one or more new water mains ten or more miles in length.
   - new water service to a municipality across a municipal boundary through new or existing pipelines.

   Will your water withdrawal require MEPA review Yes ☐ No ☐

3. Water Management Act (WMA) Permit/ DEP Water Management Program *(310 CMR 36.00)*

A water withdrawal permit is required for new or expanded water withdrawals above the threshold volume. Water withdrawal uses may include, but not be limited to **public water supply**; industrial uses; agricultural uses, such as **cranberry growers**; and irrigation uses, such as for **golf courses**.
Threshold volume means:

- an average daily volume of 100,000 gallons for any period of three consecutive months, from a total withdrawal of not less than 9,000,000 gallons; or
- an average daily volume of 100,000 gallons for periods which exceed three consecutive months, calculated by dividing the total withdrawal by the period of operation.
- a permit amendment is required for existing permit holders adding a new source where system wide withdrawal volumes are not being increased.

3a. Will your water withdrawal require a WMA permit? Yes ☐ No ☐

3b. Are you currently a Registrant and/or a Permitee under the WMA? Yes ☐ No ☐

If yes, provide registration and permit numbers:

Registration Number(s)	Permit Number(s)
_____	_____
_____	_____

4. Interbasin Transfer (IBT) Act Approval / Water Resource Commission *(MGL ch 21 ss. 8B-8D)*

(See Massachusetts Major Basin Map at http://ma.water.usgs.gov/basin)

An interbasin transfer is defined as any transfer of the surface and groundwater, including wastewater of the Commonwealth outside a river basin. A water transfer must cross one of the basin boundaries and a municipal boundary line to be considered an interbasin transfer. If a community is sewered to another town out of the basin of the water supply, the Interbasin Act may be triggered.

An interbasin transfer is any action that increases the ability to transfer water or wastewater out of a donor basin over the present rate of interbasin transfer. Actions requiring review include but are not limited to:

- drilling of production wells;
- significantly increasing the capacity of a well;
- development of a reservoir or enlargement of reservoir storage capacity;
- building of transfer facilities, such as pumps, pipelines, tunnels or other conveyance facilities;
- building of water filtration plants where such plants increase the ability to transfer water out-of-basin;
- changes in any withdrawal constraints contained in any provision of MGL, Special Acts, Judicial decree, regulatory agency rule or operating rule of a water supplier;
- structural change in a wastewater system that causes an increase in the transfer out of a donor basin.

Will your water withdrawal require an IBT application review? Yes ☐ No ☐
see ** below

** If your proposed withdrawal will require an IBT review:

- be advised that certain performance standards, including prerequisite requirements, must be met for application approval. See *Interbasin Transfer Act: Performance Standards Guidance, adopted August 12, 1999.*
- the applicant also must meet with DEM/Office of Water Resources staff before the Alternative Analysis is completed and submitted as part of the Request For Site Exam application.

5. Wetlands Permit / Massachusetts Wetlands Protection Act *(MGL ch 131, s. 40) (310 CMR 10.00)*
   Administered by DEP and Local Conservation Commissions
   Any work in a wetlands or within 100' buffer of the wetlands. This includes creating an access way to the water withdrawal, as well as drilling, pumping, and filling wetlands.

   5a. Will your water withdrawal require a Wetlands Permit? Yes ☐ No ☐

   5b. Is your proposed withdrawal within the 200' riverfront area? Yes ☐ No ☐

6. 404 Permit / Army Corps of Engineers (*Clean Water Act of 1977)*
   Are you planning any dredging or filling for your water withdrawal in a waterway or wetland?
   Section 404 of the Clean Water Act defines the landward limit of jurisdiction as the high tide line in tidal waters and the ordinary high water mark as the limit in non-tidal waters. When adjacent wetlands are present, the limit of jurisdiction extends to the limit of the wetlands.

   Will your water withdrawal require a 404 Permit? Yes ☐ No ☐

7. 401 Permit / DEP 401 Water Quality Certification Program *(314 CMR 9.00)*
   Provides added protection for projects with the potential for large or cumulative impacts to ensure compliance with the surface water quality standards. Actions, involving but not limited to, any one activity listed below, that require a 401 application review are:
   - loss of greater than 5,000 square feet of wetlands;
   - within an Outstanding Resource Water;
   - involving any real estate subdivision;
   - not subject to the Wetlands Protection Act
   - containing rare or endangered species habitat in isolated vegetated wetlands;
   - within a salt marsh;
   - dredging greater than 100 cubic yards.

   Will your water withdrawal require a 401 Permit? Yes ☐ No ☐

APPENDIX A

Department of Environmental Management
Office of Water Resources
Basin Plan Status, August 2000

BASIN	VOLUMES	UPDATES
Hudson River Basin	I, II, III*	
Ipswich River Basin (including communities in the North Coastal)	I, II, III	
Charles River Basin	I, II, summary draft III (never completed)	Demands
Concord River Basin	I; Short Hydrology	Some Demands

Blackstone River Basin	I; conceptual plan (3 versions)	Demands?
Nashua River Basin	I	Demands
Neponset River Basin	I; I,II,III combined plan	Demands
Taunton River Basin	I; I,II,III combined plan	Demands + inflow/outflow
North Coastal	I,II,III combined plan	
Mystic River Basin	Short Hydrology/Demands	
Ten Mile River Basin	Short Hydrology/Demands	
Weymouth-Weir Basin	Draft I; Short hydrology/demands	
South Coastal	Draft I; I,II,III combined plan	
Cape Cod	Basin plan	
Islands	Short Hydrology/Demands	
Deerfield River Basin	Short Hydrology/Demands	
Housatonic River Basin	Basin Plan	
Westfield River Basin	Short Hydrology/Demands	
Farmington River Basin	Short Hydrology (combined with Westfield) No Demands	
Millers River Basin	Short Hydrology/Demands	
Chicopee River Basin	Short Hydrology/Demands	
Connecticut River Basin	Short Hydrology/Demands	
Buzzards Bay	Basin Plan	
Parker	no plan	Demands only

*Unless otherwise noted, Volumes I, II and III make up a full basin plan

APPENDIX B

Supportive materials:

- Basin Plans (see Appendix A)
  Contact DEM / Office of Water Resources for further information.
- Outstanding Resource Waters (ORWs)
  Contact DEP Regional Office for further information.
- Stream indicators (7Q10 and August Median) and low flow statistics
  USGS Water Resources Data for Massachusetts
  USGS Gazetteers of Hydrologic Characteristics of Streams in Massachusetts
  USGS websites: http://ma.water.usgs.gov/basin

http://ma.water.usgs.gov/streamstats

- References:
  - Jenkins, C.T., 1970 Computation of Rate and Volume of Stream Depletion By Wells. USGS Techniques of Water-Resources Investigations, Book 4, Chapter D1.
  - Barlow, P.M., 1999 USGS/ Documentation of Computer Program STRMDEPL – A Program to Calculate Streamflow Depletion by Wells Using Analytical Solutions. (Work in progress)
- NPDES sites
  Contact DEP / Watershed Permitting Program / Surface and Groundwater Sections

List of related programs and phone numbers:

EOEA Basin Team Leader Information ……..		617 727-9800
EOEA Community Preservation Buildout …….		617 626-1153
Massachusetts Natural Heritage Program		508 792-7270
MEPA		617 626-1020
MassGIS		617 727-5227
DEM/	Office of Water Resources	617 973-8755
	Water Resource Commission	617 626-1050
	Interbasin Transfer Act	617 973-8745
Army Corps of Engineers / 404 Permit		800 362-4367
DEP/	Boston switchboard	617 292-5500
	Western Region	413 784-1100
	Central Region	508 792-7650
	Northeast Region	978 661-7600
	Southeast Region	508 946-2700
	DEP Basin Chiefs, contact DEP regional offices	
	Water Management Program	617 292-5706
	Drinking Water Program	617 292-5770
	Wellhead Protection Program	617 556-1070
	Wetlands and Waterways	617 292-5695
	401 Water Quality Certification Program	617 292-5655
	Bureau of Waste Site Cleanup	617 292-5648
	DEP GIS	617 556-1115